

it is in that age-group that the greatest good can be accomplished.

If I have failed to capture your attention in my rather lengthy discourse, I beg your kindly indulgence. I believe that organized medicine should not only get into the spirit of the "New Deal," but, with banners flying, should forge to the front and lead. And I know that if I, both as an individual and in my official capacity, am able to point the way even in a small measure, my own life will have been the richer for it.

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SPINAL ANESTHESIA*

ITS TECHNIQUE, RECORDS, AND RESULTS

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IT has been my good fortune to be able to attend the last two meetings of the Section of Anesthesiology of the California Medical Association. I have derived much pleasure and profit from them. This year your chairman has done me the honor to give me a place on the program. I have accepted the invitation with considerable diffidence because I know that there are many here whose knowledge of the subject is greater than mine. As a matter of fact, Doctor Harris' excellent paper on technique, and Doctor Waters' talk on the causes of blood pressure drop in spinal anesthesia, presented at the San Francisco meeting two years ago, gave me much of the information upon which our Harborview Hospital technique was based. Moreover, in presenting our technique for consideration, I fully realize that there are other well-established and successful ways of obtaining the same results. This one was devised to meet our particular needs of simplicity and safety, and has proved so satisfactory that we have continued with it. There is but one idea for which we can claim any originality, namely, that of controlling a simple solution of novocain crystals in spinal fluid by gravity. But even without presenting anything new it is worth while, I think, to evoke further discussion of spinal anesthesia by this group, because some of our best members still do not accept it, and I feel that it should be part of the anesthetist's equipment for his task.

WHERE THESE OBSERVATIONS WERE MADE

Harborview Hospital in Seattle is a charity hospital of 450 beds, recently built and well equipped. Our anesthetic staff is small, consisting of myself, one assistant, and an interne, who is on duty for thirty-one days. The form of anesthesia for a given case is generally chosen by the senior surgical resident, although I am consulted in special or doubtful cases. The final decision rests with the surgeon. Spinal anesthesia has been an accepted procedure since the hospital was opened in March, 1931. At first it was adminis-

tered by the operating surgeon, or by the assisting resident or intern under his direction; but there was such a wide variation of technique that it was soon found advisable to have us formulate a routine procedure which an interne could easily master, and to turn the administration over to us. Simplicity and safety have been our ideals.

BRIEF HISTORY OF SPINAL ANESTHESIA

A brief history of spinal anesthesia will throw some light on the different methods of administering and controlling it. Spinal anesthesia was accidentally discovered by J. Leonard Corning of New York in 1885 in the course of experimentation upon dogs with anesthetic drugs. It was first used upon a human being in 1898 by Bier, who had the temerity to allow cocaine to be injected into his own spine. Meanwhile, in 1891, Quinke had given us the technique of lumbar puncture. In October, 1899, Tait and Cagliari did an osteotomy of the tibia, and in December, 1899, Dr. Rudolph Matas injected one per cent cocaine into the spinal canal and performed a hemorrhoidectomy. These were the first cases in the United States. Spinal anesthesia, however, remained a surgical curiosity.

In 1907, Barker in England, and Chaput in France, worked out the principles of gravity control technique. Barker used 10 per cent stovain, with glucose 5 per cent, sterile water 85 per cent; specific gravity, 1.0300. Chaput used stovain 10 per cent, sodium chlorid 10 per cent, sterile water 80 per cent; specific gravity, 1.0831. These solutions were both much heavier than cerebrospinal fluid, which has a specific gravity of from 1.004 to 1.007. They were able to control these heavy solutions by gravity. Their principles were absolutely correct, but the method was not generally understood or adopted, for neither glucose nor salt in such concentration is desirable in the spinal canal.

In 1908, Jonnesco presented his method of high or low spinal puncture with the injection of a stovain and strychnin solution. His tour of this country in 1910 (I saw him demonstrate at the University of Pennsylvania) failed to impress the profession, as many bad results were mingled with the good. His method of varying the height of anesthesia by spinal puncture in different interspaces is still one of the recognized methods of varying the anesthetic level, although his high anesthesia is outlawed as too dangerous.

Later Le Filliatre, in France, devised a barbotage technique, and added this much-misunderstood term to spinal anesthesia nomenclature. He disseminated his anesthetic drug in from 10 to 20 cubic centimeters of spinal fluid, and was thereby enabled to produce anesthesia to the neck. His principles, somewhat modified, have been retained by the French school, and form the basis of the volumetric method of control.

About 1912, Wayne Babcock, who has for a generation been one of the successful exponents of spinal anesthesia, devised a solution of stovain in distilled water, with lactic acid to acidify it, alcohol to make it lighter than spinal fluid, and strychnin to fortify the spinal cord. This solution

* Guest-speaker paper, read before the Anesthesiology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

attained some popularity. It depended for effectiveness upon dispersion in the spinal fluid. I used it a few times in 1915, but I must admit that I did not know much about what I was doing. Little was known by the profession at large of the principles involved in spinal anesthesia, and naturally many deaths occurred. The method was held to be unsafe and again fell into disrepute, save for a few pioneer souls who went on perfecting the technique and gaining knowledge of the physiologic principles.

DRUGS USED IN SPINAL ANESTHESIA

Many drugs have been tried for spinal anesthesia, but all proved unsatisfactory in some particulars until the advent of novocain. About 1920, Doctor Gaston Labat worked out the method he has used and taught successfully ever since. He uses neocain (French novocain) crystals dissolved in spinal fluid, and disperses it by barbotage to the desired level. He insists upon Trendelenburg position as a protection against cerebral anemia. He has a large following all over the country.

It remained, however, for George P. Pitkin to give spinal anesthesia the impetus which has re-established it in popularity and usefulness during the past five years. After careful and numerous animal experiments, he devised a novocain solution in a special medium which was given the rather unscientific name of spinocain, and a technique for controlling its action. This solution, as you all know, consists of novocain, sterile water, alcohol and a starch, amyloprolamin. It is lighter than spinal fluid. It depends upon dispersion plus gravity control. A carefully worked-out technique is given for reaching the desired levels. It is the logical method for cases that must be put into deep Trendelenburg position for operative convenience.

The method described by Harris at the convention two years ago was one of volumetric control, not obtained by barbotage but by simple withdrawal and reinjection of the desired quantity of spinal fluid, after dissolving in it a dose of novocain proportional to the length of effect desired.

FACTORS WHICH INFLUENCE SPINAL ANESTHESIA

Practically every authority differs in some detail from the others. The reason for this is apparent when one considers the many variable factors which may influence spinal anesthesia. I shall name some of them without further comment:

1. Position of the patient during puncture.
2. Interspace chosen.
3. Volume of fluid withdrawn.
4. Dose of drug.
5. Resultant concentration of solution.
6. Rate and force of injection.
7. Intradural pressure of the spinal fluid.
8. Specific gravity of solution.
9. Barbotage.
10. Position of patient after puncture.

These are the major variables, as I see them. I believe that Professor Waters said that there were fifteen. At any rate, any one of them can influence the result. Is it any wonder, then, that

different men have different methods? With this explanation, I shall briefly present the method that we use, and our reasons for each step, expecting to encounter differences of opinion regarding them all.

HARBORVIEW HOSPITAL GRAVITY CONTROL TECHNIQUE

General Rules for Safety.

1. Spinal Anesthesia is not to be used for operations above the diaphragm, nor for those expected to take more than two hours. (Nitrous oxid and oxygen may be used if the operation is unduly prolonged.)

2. Novocain crystals, dissolved in spinal fluid, to be the anesthetic agent. Maximum dose, 200 milligrams.

Comment.—While high anesthesia, and even total anesthesia, is possible by the spinal route, as shown by Vehrs of Portland, and others, it has an inherent high mortality which we are not justified in incurring. But spinal anesthesia, limited to the diaphragm and below, has a comparatively negligible mortality. It is the spinal anesthetics that "get away" which cause alarming symptoms and death.

Cocain, tropococain, stovain, apothessin, butyn, and other drugs have been tried and discarded, one by one, until today novocain (the German product) or neocain (the French) in pure crystalline form have the field to themselves. American-made procain seems not so reliable. Nupercain and pantocain are not yet established.

The cerebrospinal tract is so intolerant of drugs and foreign substances in general (even normal saline solution being irritant) that it seems unwise to introduce any foreign substance—such as alcohol, strychnine, starch paste, lactic acid, glucose, or salt—other than the anesthetic drug itself.

ZONES

For the sake of simplicity, we use but two zones.

1. To the umbilicus: For genito-urinary cases, gynecology, appendectomy, orthopedic work in the legs, herniotomy, etc.

2. To the costal margin or diaphragm: For gall-bladder and stomach surgery, general exploration, intestinal obstruction, etc.

Comment.—It seemed unnecessary to attempt the fine differentiation into smaller zones, especially as our safety rules kept us with the diaphragm as our upper limit. As experience is gained, we do attempt to limit anesthesia to the perineum, for example, or to the perineum and legs, and for kidney cases to carry it higher on the side to be operated on; but these are refinements of the method which must wait on experience with it. We do not expect our interns to do these things on their second day of service, but we do expect them to carry out the general instructions from that time on.

DOSAGE

For the same reason we use, as a rule, but two dosages.

1. One hundred milligrams for operations of forty-five minutes or less, limited to zone 1.
2. Two hundred milligrams for longer operations, and for zone 2.

Comment.—We vary the dosage occasionally, but for major work generally give the full dose of 200 milligrams. We have proved that this dose can be given routinely without harmful effect, unless there is an idiosyncrasy to novocain. For rectal work we have given as little as 50 milligrams. For upper abdominal work in robust individuals, we have five times given 300 milligrams.

PRELIMINARY MEDICATION

The patient receives the usual preoperative medication.

1. A barbiturate (generally sodium amytal) the evening before, and also early in the morning of operation.

2. Morphine and atropine in suitable doses, one hour before operation.

Comment.—Spinal anesthesia can be successfully administered without this preliminary medication, but the patient is in better condition mentally and physically with it. We do not fear a summation effect upon respiration, circulation, or blood pressure. We agree with McKesson that holding pulse, respiration, and blood pressure at or below normal is for the patient's best interest—a state of artificial hibernation, he calls it.

POSITION

Sitting sidewise on operating table; back bowed; patient supported, "nose to knees."

Comment.—We use the lateral position whenever the patient is too ill or too crippled to sit up, but find the puncture more easily made in the sitting posture. Moreover, the upright position is the logical one when using a heavier than spinal fluid solution.

PREPARATION

Tincture of iodine, half strength.

POINT OF INJECTION

The fourth lumbar interspace, or the first feasible interspace above it.

Comment.—We avoid high injections for many reasons, but chiefly because their results cannot be accurately predicted, and the resultant anesthesia may go too high. The fourth lumbar interspace is most easily located. It leads into a relatively large well of spinal fluid. It is below the end of the spinal cord, thus avoiding possible permanent injury to that structure. While the needle often touches a nerve of the cauda equina, as manifested by a sudden twinge in one leg, experiment has proved that it cannot pierce it at this level.

VASOMOTOR STIMULATION

None.

Comment.—We formerly used ephedrine sulphate, grain one-half hypodermically, given at the time the lumbar puncture was started; that is, about five minutes before the novocain was injected. This often caused a slight rise of blood pressure before the spinal anesthesia became effective. For the past six months or more, on the

strength of Labat's argument, we have omitted it, and find that our patients apparently get along as well. Should there be collapse during the anesthesia, we would use first of all artificial respiration, then epinephrine or coramine, or both, as inhalation. Mouth to mouth insufflation is sometimes necessary.

ARMAMENTARIUM

1. Syringes: A two cubic centimeter and a ten cubic centimeter Luer syringe.

2. Needles: A very fine, one-half inch needle for the first skin wheal. A one and one-half inch needle for deeper injection of the tissues. Two spinal needles, gauge 20, short bevel. A Wassermann needle for mixing.

3. A pointed Bard-Parker blade to nick the skin.

4. A 200 milligram ampoule of novocain crystals.

5. A file.

6. Tincture of iodine, 3½ per cent, sufficient quantity.

7. Novocain solution, one-half of one per cent, sufficient quantity.

8. Sterile gloves.

Comment.—The superiority of the small-gauge, short-bevel spinal needle over the old Bier type needs no emphasis. The blade for nicking the skin makes for neater work.

LUMBAR PUNCTURE

1. Paint back with tincture of iodine.

2. Locate fourth lumbar interspace. Mark injection point with thumb nail.

3. Fill two cubic centimeter syringe with novocain solution. Attach small needle. Make skin wheal at point marked. Withdraw needle. Reinsert to full depth and infiltrate one cubic centimeter.

4. With longer needle, infiltrate interspinous ligament and tissues around foramen.

5. Nick skin with knife point.

6. Insert spinal needle at right angles to skin, bevel parallel to axis of spine, until dura is penetrated and spinal fluid flows freely. Replace stylet.

Comment.—Lumbar puncture should be painless except for the first needle-prick. It is more easily described than done neatly, but facility is soon acquired. Even the experienced man, however, will occasionally have difficulty. The oblique approach often helps in hard cases.

INJECTION

1. Break neck of ampoule.

2. Withdraw stylet and allow four cubic centimeters of spinal fluid to drop into ampoule. Replace stylet.

3. With the Wassermann needle on ten cubic centimeter syringe, dissolve novocain crystals by barbotage. Detach Wassermann needle.

4. Withdraw stylet. Attach ten cubic centimeter syringe and inject novocain-spinal fluid solution at uniform rate: one cubic centimeter in five seconds. Withdraw spinal needle.

Comment.—A constant amount of four cubic centimeters is withdrawn. This, with two hundred

milligrams of novocain, makes a five per cent solution, with a specific gravity .008 higher than spinal fluid alone. It is this small difference, however, that makes gravity control possible, as proved experimentally and clinically. The slow, uniform rate of injection gives a slight, but practically uniform amount of dispersion in the fluid in the canal. This amount of dispersion will carry anesthesia to the umbilicus, unless modified by position of patient.

FOR ZONE I

1. Place patient on back, or in required surgical position, *not in Trendelenburg* position. Support head and shoulders with pillow. Proceed with preparation.

2. Test level of anesthesia with pin or hemostat. If satisfactory, operate. If too low, lower head five degrees, and wait until satisfactory level is reached, then level table.

FOR ZONE 2

1. Proceed as before, but lower head of table 5 to 10 degrees. Prepare patient.

2. Test level of anesthesia from time to time. When high enough, level table and operate.

Comment.—Trendelenburg position, if continued with this method, will carry anesthesia too high. Therefore, do not use it as a routine. If deep Trendelenburg is required for the operation, wait at least ten minutes, or modify the technique by using twice the amount of spinal fluid, thus producing a 2½ per cent solution of specific gravity 1.008; .004 higher than spinal fluid alone.

GENERAL SUGGESTIONS

1. Handle patients gently.
2. Handle needles by the hub, not by the point or shaft.
3. Avoid loss of spinal fluid.
4. Keep track of blood pressure at appropriate intervals throughout anesthesia.

Comment.—With experience the five-minute blood pressure readings may safely be omitted. As shown by Bowers, respiratory distress is the thing to watch for. Watch the patient's color and respiration; feel the skin for temperature and dryness. These will sufficiently indicate the patient's condition to the experienced man.

This technique is given in detail, just as we teach it to our interns. It may be noted that the instructions are very definite: a standard posture; a definite place for the puncture; a definite amount of spinal fluid; a definite dose of the drug; and a definite rate of injection. This, we believe, makes for uniformity of results. It can be used without modification for over 90 per cent of the cases.

EXCEPTIONS

This technique, unmodified, is not suitable for cases requiring extreme Trendelenburg. Such are suprapubic prostatectomies. The use of four cubic centimeters of five per cent solution with deep Trendelenburg will kill these old men with their sclerotic arteries and their compensatory high blood pressure; for the novocain solution will gravitate higher and higher, causing a greater

and greater blood pressure drop and respiratory paralysis, resulting in a degree of shock from which they will not recover. The same physical factors obtain in certain gynecological cases, but are not as disastrous since these younger subjects stand the fall of blood pressure better. But such a drop should never be allowed to occur. Pitkin's spinocain is excellent for these cases, or one may use a 2 or a 2½ per cent solution, which does not gravitate so far nor so fast.

RECORDS

The standardization of hospitals about a decade ago brought about the glorification of the written record. Among others, came the standard "safety first" anesthesia record sheet sponsored by the National Anesthesia Research Society, which has been widely adopted. Records became a sort of fetish, and anyone who did not fall in line was a hopeless mossback. But as a matter of fact, most of us had devised and used anesthesia records long before they were popularized, and we know well their virtues and their shortcomings. I find that comparatively few of the best anesthesiologists meticulously keep the five-minute record which the standard chart calls for. Instead they record essential data, and state on the chart their general impression of the patient's condition and the difficulties, if any, which have been encountered. For you all know that it is mechanically impossible to administer the anesthetic in certain cases and keep records at the same time, unless, indeed, as has been suggested, the anesthesiologist should grow four hands and a prehensile tail! Where everything is going smoothly the record can be kept, but in time of trouble, when data would be most valuable, it is impossible to obtain them. A faked record—one in which the gaps are filled in by guess—is much worse than an empty one. I have noticed that the best-looking records are often turned in by the least competent anesthesiologists. "Intellectual honesty" should be upheld even at the cost of appearances.

However, when we want to find out something, nothing takes the place of records. At the outset our knowledge of spinal anesthesia and its results was practically nil, and we wanted to learn as rapidly as we could. We found that the Standard anesthesia sheet was not well adapted to recording the technique and phenomena of spinal anesthesia. Accordingly we devised a special record form on which these things could be put down. We have 477 of these records—some of them incomplete—and they furnish a rather indisputable array of facts. As someone has said, "Facts are stubborn things." Our total experience at the Harborview Hospital now comprises over 1,700 cases. It is upon the facts shown by these case records, and substantiated in the rest of the series, that our conclusions are based.

CONCLUSIONS

The sheet was intended to record (1) the details of technique and (2) the results of our procedure. Tabulation of these records shows that the unmodified technique has been used in 95 per cent of the cases. Most of the modifications

were for nupercain or pantocain. This argues for its general applicability. Supplementary anesthesia was used in 36 per cent of the cases. This is a high proportion, but is explained by two facts: many of our operations run well over an hour, and no attempt is made to avoid supplementary anesthesia if the patient is afraid, or feels touch or traction, or even if he just prefers to be asleep. There were 1.4 per cent of complete failures; by which I mean cases in which anesthesia either failed to develop or was of such slight intensity that pain was felt. It is the custom to ascribe these failures to faulty technique and deposit of the anesthesia solution outside of the dura. I cannot accept this explanation as adequate, for in several cases it seemed that we must be in the dural sac, as we used a short-bevel needle and had a free flow of spinal fluid. I think, rather, that there are individuals in whom usual strength solutions of novocain have little or no effect, just as there are those who are hypersensitive to novocain; for we see failures in other types of local anesthesia which can be explained on no other ground.

MORTALITY

This series of 1,700 cases contains four deaths on the table, only two of which can be considered as chargeable to spinal anesthesia.

The first of these, No. 195 of our series, an advanced intestinal obstruction case, was moribund when brought to the operating room. Twenty minutes after the spinal was given, respiration failed and the patient died. A death from advanced toxemia and shock; not an anesthetic death.

The second, No. 365, was an advanced cardiac case with ascites, in whom the novel operation of implanting the saphenous vein into the peritoneal cavity, for the purpose of draining the latter, was attempted. The patient was a heavy man, and water-logged; his heart had been progressively failing for several hours. He sat up to receive his spinal (an error of judgment, perhaps) and died five minutes after it was administered. I think his death was due to the additional strain of the sitting posture, upon a heart just about ready to stop.

The third case was more recent. This was a very sick woman, with a blood-stream pyogenic infection, and multiple abscesses in the right kidney. Pulse was 140 to 150 before operation; advisability of operation was questioned, but after examining her I felt that we should take the chance, as it was her only one. I gave her the usual dose, placed her on her right side with the head of the table lowered, then turned her over and placed her in the kidney posture. Here I made an error. With the table broken, I allowed her head to be lower than the kidney area, and I think the anesthetic advanced slowly upward, increasing her respiratory difficulty so gradually that she was gone almost before I realized it. In extenuation, it may be said that one could not detect cyanosis in the negro skin; that her heart was so feeble from the beginning that I could not follow the temporal pulse; and that she was in such a position and so covered with drapes that I could scarcely see her shallow respiration. I acknowledge this, however, as a spinal anesthetic death. A peculiar thing, and one that misled me, was that her pupils remained small, even after death. Can any of you explain this fact?

Since this paper was begun it has become necessary to add a fourth case, which occurred in the hands of one of my best interns. His report is as follows: "Male patient; forty-seven years; weight, 232 pounds. Blood pressure, 130/80; pulse, 120; temperature, 102. Spinal; 175 milligrams novocain crystals given in the third lumbar interspaces at 11:55 p. m. Patient had

received pantopon, one-third grain, and ephedrin, one-half grain, preoperatively. Anesthesia to umbilicus in five minutes. Head not lowered at any time—was raised on pillow. Marked drop in blood pressure in seven minutes. Patient became cyanotic. Ephedrin, one grain, and one ampoule of coramin given. Patient was pulseless radially at 12:05 a. m. Two cubic centimeters of adrenalin given directly into heart. Carbon dioxid and oxygen given, with artificial respiration for thirty minutes. No sign of response at any time."

I am at a loss to explain this death, unless it was due to the toxicity of the novocain itself.

Honesty compels me to say that we have had other alarming cases, comparatively few in number, however, which have had a more fortunate outcome. One of these occurred recently, and is of interest from the standpoint of the toxicity of novocain. The case, one of intestinal obstruction, came in as an emergency at midnight. The intern who gave the anesthetic reported to me that the patient had collapsed shortly after the spinal was given, and that they had had to work hard to restore her. An emergency cecostomy was done. Two weeks later I gave her a spinal for a left inguinal colostomy, using the usual routine. Anesthesia came up to the umbilicus. Twenty minutes after the spinal was given, while all was apparently going well, she suddenly gasped and turned pale and respiration ceased. I could get no pulse. The usual measures were applied, the most effective being mouth-to-mouth insufflation, and after twenty minutes' work she was breathing well and her heart beating strongly. She was watched closely for hours, but had no further difficulty. One month later she was brought up for removal of the growth from the sigmoid. Twenty cubic centimeters of one-half of one per cent novocain solution was used for local infiltration, and she had a similar syncope, though not alarming. This seems to establish the case as one of extreme susceptibility to novocain. I can think of no practical way to tell these cases beforehand, as it surely is not feasible to give all patients a preliminary test injection.

SUMMARY

I have not attempted to discuss the pros and cons of spinal anesthesia as a method. Common sense should govern its use, as with other anesthetics. It is true that some bad risks can be handled better with spinal anesthesia than with any other method, but it should not be used indiscriminately nor as a last resort for all the bad cases. Otherwise it will be unfairly charged with a high mortality, which it does not deserve. We offer the Harborview Hospital technique as a means of keeping a good mortality record for spinal anesthesia, for we can honestly say that we have very few patients who show any alarming symptoms whatever. In the majority of cases the shock-like symptoms are conspicuous by their absence.

CONCLUSIONS

Our experience with spinal anesthesia given by this technique leads us to the following conclusions:

1. Gravity, or postural, control of the level of spinal anesthesia is feasible, simple, and as safe as any other method.

2. Gravity control is possible with a five per cent solution of novocain crystals in spinal fluid, without the addition of any other substance.

3. With this technique the Trendelenburg position is not only not indicated; it is definitely contraindicated, except as used to increase the height of anesthesia.

4. With this technique, the novocain is not all "fixed" by the nerve tissue in contact with it, in ten minutes, as is generally taught. It is possible to shift the level of anesthesia after fifteen or twenty minutes in most cases.

5. Untoward symptoms can be avoided by holding the upper limit of anesthesia to the costal margin.

6. Two hundred milligrams of novocain is a safe dose in anyone not having an idiosyncrasy toward it, and gives a desirable length to the anesthesia.

SUMMARY

1. Reasons for devising Harborview Hospital technique.

2. Brief history of spinal anesthesia.

3. Harborview Hospital technique presented in detail.

4. Records, and what they show.

5. Conclusions.

1409 Medical and Dental Building.

PHYSICAL THERAPY IN CALIFORNIA*

A SPECIAL COMMITTEE REPORT

A SPECIAL Committee on Physio-Therapy was appointed by the Council of the California Medical Association in September, 1932. The committee consisted of Doctors Charles L. Lowman, Howard Naffziger, Rodney F. Atsatt, H. Leslie Langnecker, and John Severy Hibben (chairman).†

SCOPE OF PROGRAM

In outlining its work, the committee decided

1. To survey the practice of physical therapy from the standpoint of:

(a) Education—graduate and undergraduate;

(b) Practice—by general practitioners, or institutions, and by unlicensed technicians.

2. To submit a report in writing of their findings, with recommendations, at the next regular meeting of the California Medical Association.

Among the reasons advanced for creating such a committee was the suggestion that many members of the medical profession do not fully understand that physical therapy agents are a part of the regular professional armamentarium in the practice of medicine and surgery; that those practicing physical therapy should have opportunities to receive ample training and postgraduate instruction, and that the instruction should be given

* A report submitted by a California Medical Association Committee on Physiotherapy, and read before the Council of the California Medical Association, Del Monte, April 25, 1933.

† The chairman and members of the committee wish to thank Dr. Richard Kovacs, chairman of the Committee on Physical Therapy of the New York County Medical Society, personally for his time and interest in furthering the work of the California committee.

by qualified physicians or by teaching institutions, not by salesmen of manufacturers or hired lecturers. It was recognized that while competent technicians should be used to carry out therapeutic measures, the responsibility for medical judgment in every case, from day to day, rests squarely on the shoulders of the practicing physician. Whenever a physician cannot himself intimately supervise the indicated measures, he should, of course, refer his patient to a physician trained in physical therapy, or to a hospital department under a physician's control.

QUESTIONNAIRE RESPONSES

Questionnaires were sent to all of the medical colleges, hospitals, and county medical societies in the state, with the following results:

1. Survey:

(a) Of the four medical colleges in California, only two offer undergraduate instruction in physical therapy.

(b) Questionnaires were sent to thirty-nine of the county societies of the California Medical Association, each being asked to appoint a special committee to cooperate with the state society committee. In this way, interest and attention were directed toward physical therapy, not necessarily to increase its use, but to improve the quality of work. Of the thirty-nine county medical societies, five have created special committees on physical therapy; with two the matter is pending. The San Francisco County Medical Society has had an active functioning committee which recently made a survey of physical therapy in the hospitals in San Francisco County.

(c) To fifty-one hospitals in California, questionnaires were sent and thirty-nine replied. In reply to the first question—Do you possess a physical therapy department?—thirty-five, or 89 per cent, answered yes, and four, or 11 per cent, answered no. To the second question—Is it under the control of a qualified physician?—thirty-five replied. Of these twenty-four, or 68 per cent, answered yes, and eleven, or 32 per cent, answered no. The committee offered its advisory services to all hospitals contemplating the establishment of a physical therapy department. The committee also suggested the presentation of papers at staff meetings in order to stimulate a better and more intelligent discussion of the value and limitations of physical therapy. Effort will be made to have manufacturers and distributors of physical therapy and x-ray equipment cooperate to discourage or do away with commercial lecture courses.

2. Educational activities:

Papers, lectures, and films have been given and shown before medical societies and hospitals as follows:

Paper—"Physical Agents in the Treatment of Pneumonia."

An educational film on "Physical Therapy." This was shown three times, with explanatory comments.

A film on "Massage" was shown before the Western Hospital Association annual convention. Corrective exercise literature was supplied by the